

Result of Sample Tree Enumeration of Pusad Forest Division

Pusad forest division is one of the forest divisions of Yavatmal circle. The forest extends over an area of 744.28 sq. km..

Climate:- The weather remains hot and dry. The mean minimum temperature and mean maximum temperature recorded are 4.08⁰C and 45.9⁰ C respectively.

Forest Area:- In view of Management & Legal Status, as per Annual Administration Report, the details of forest area of Pusad Division as on dated 31/3/2017 are as follows.

Table No-1
Classification of Forest area according to Management & Legal status
(Area in Sq. km.)

Sr. No.	Controlling Agency	Reserved forest	Protected forest	Un-classed forest	Total Forest
1.	Area in charge of Forest Department	700.35	4.52	10.34	715.21
2.	Area in charge of F.D.C.M.	29.07	--	--	29.07
3.	Private Forest brought under possession of Forest Department	---	---	---	---
Total		729.42	4.52	10.34	744.28
% to total forest area		98.00	0.61	1.39	100

Pusad forest division consist of 6 Ranges. The Range wise Forest area under Scientific Management as recorded in Working Plan (2008-09 to 2017-18) by Shri Dinesh Kumar Tyagi, IFS and G. Rama Krishna Rao, IFS, Conservator of Forests Working Plan Division Yavatmal is as under.

Table No.2

Sr. No	Names of Ranges	Total Forest area in (ha)
1.	Digras	16392.93
2.	Pusad	16828.97
3.	Shembalpimpri	12728.70
4.	Umerkhed	11222.45
5	Mahagaon	10293.78
6	Bittergaon	1968.43
	Total	69435.26

Now Conservator of Forest, Working Plan Pusad, has proposed following working circle wise forest area, for sample tree enumeration.

Table No.3
Working Circle wise Area proposed for tree enumeration

Sr. No.	Name of working circle	Population area in ha
1	Afforestation W. C.	11292.75
2	Catchment Area Treatment W.C.	12979.72
3	Selection Cum Improvement W.C.	35049.74
4	Fodder Improvement W.C.	1024.38
5	SCI/Misc. W.C.	1564.28
6	SCI/CAT W.C.	2521.86
7	CAT/Misc. W.C.	1820.85
8	SCI/FIWC	381.63
9	SCI/AWC	1121.97
10	Miscellaneous W.C	1667.79
	Total	69424.97

Sampling plan of Tree Enumeration

Actually the tree enumeration work was done by Forest Resources Survey Scheme, Amravati during Sept.2015 to Feb-2016. The entire forest division's area was considered for sampling enumeration plan. The trees are enumerated in girth classes started from 31-45 cms to Above 150 cms. The girth is measured at breast height (g.b.h.).

The statistical sampling method namely "Systematic Line Plot Sampling with Random Start" was used for tree enumeration. The plot size is of 50"x50" (50 seconds x 50 seconds) i.e. 225 ha. In each plot of size 225 ha., 0.1 ha. plot was enumerated. The complete enumeration of trees, Natural regeneration, Grass and Medicinal species were carried out in these plots. Similarly qualitative measurements were also carried out.

On scrutiny of data and preparation of results i.e. (1) Stock per hectare was calculated and the result are being reported in the form of following statements.

Statement I : Estimated growing stock- No. of Sound trees in population area.

Statement II : Estimated growing stock- No. of Sound trees per ha.

Statement III : Percentage distribution of total stock of species over all girth classes.

Statement IV : Percentage of stock of species in a girth class to the total stock in that particular girth class.

Statement V : Estimated growing stock - volume in cum./ha.

Some noteworthy result on current enumeration is described in following Table No. 4(a)

Table No. 4 (a)**Statement showing estimated No. of trees per ha. in Previous (Oct 2003 to March 2004) and Current (Feb-2015 to Feb-2016) tree enumeration**

Sr. No	Name of Working Circle	Past enumeration (Oct-2003 to March-2004) No. of trees per ha.	Sr. No.	Name of Working Circle	Current enumeration (Sept-2015 to Feb-2016) No. of trees per ha.
1	Afforestation Working Circle	167.00	1	Afforestation W. C.	82.76
2	Catchment Area Treatment W.C.	198.00	2	Catchment Area Treatment W.C.	234.45
3	Selection Cum Improvement Working Circle	298.00	3	Selection Cum Improvement W.C.	355.24
4	Overlapping Working Circle	407.00	4	Fodder Improvement W.C.	40.00
5	Sequence of felling and planting in Fodder Reserve W.C.	245.00	5	SCI/Misc. W.C.	285.00
			6	SCI/CAT W.C.	215.55
			7	CAT/Misc. W.C.	308.89
			8	SCI/FIWC	150.00
			9	SCI/AWC	64.00
			10	Misc. W.C.	0
Weighted Average		266.32	Weighted Average		261.44

It is observed that the total estimated number of trees per hectare in current enumeration (Sept-2015 to Feb-2016) is decreased as compared to previous (Oct-2003 to March-2004) tree enumeration.

Table 4 (b)**Estimated percentage distribution of trees in 15U30 ,31 U 45 and remaining girth class to overall girth class**

Sr.No.	Working Circle	Girth class-wise estimated percentage of number of trees			
		15 U 30	31U45	Remaining Girth Classes	Total estimated No. of trees
1	Afforestation W.C	0	49.10	51.90	100
2	Catchment Area Treatment W.C.	0	39.47	60.53	100
3	Selection Cum Improvement W.C.	0	31.79	68.21	100
4	Fodder Improvement W.C	0	56.25	43.75	100
5	SCI/MISC W.C.	0	42.10	57.90	100
6	SCI/CAT W.C.	0	32.47	67.53	100
7	CAT/MISC	0	33.81	66.19	100
8	SCI/FIWC	0	13.33	86.67	100
9	SCI/AWC	0	62.50	37.50	100
10	Misc.W.C.	0	0	0	0
Weighted Average		0	36.34	63.66	100

Working circle wise estimated, number of sound trees per hectare are as follows.

Table No.5
Working Circlewise No. of sound trees per ha

Sr. No.	Name of Working Circle	Total	General utility species	Special utility species	Minor forest produce species	Other species
1	2	3	4	5	6	7
1	A.W.C	82.76	44.47	1.91	0	36.38
	% of stock to total stock	100	53.73	2.31	0	43.96
2	CAT W.C.	234.45	147.78	21.75	43.81	21.11
	% of stock to total stock	100	63.03	9.28	18.69	9.01
3	SCI Working Circle	355.24	277.07	26.81	30.68	20.68
	% of stock to total stock	100	78.00	7.55	8.64	5.82
4	F.I.W.C.	40.00	10.00	12.50	17.50	0
	% of stock to total stock	100	25.00	31.25	43.75	0
5	SCI/MISC W.C.	285.00	202.50	17.50	65.00	0
	% of stock to total stock	100	71.05	6.14	22.81	0
6	SCI/CAT W.C.	215.55	170.00	13.33	15.55	16.67
	% of stock to total stock	100	78.87	6.19	7.22	7.72
7	CAT/MISC	308.89	240.00	18.89	12.22	37.79
	% of stock to total stock	100	77.70	6.12	3.96	12.22
8	SCI/FIWC	150.00	80.00	30.00	20.00	20.00
	% of stock to total stock	100	53.34	20.00	13.33	13.33
9	SCI/AWC	64.00	32.00	0	32.00	0
	% of stock to total stock	100	50.00	0	50.00	0
10	Misc. W.C.	0	0	0	0	0
	% of stock to total stock	0	0	0	0	0
Total weighted average		261.44	192.88	19.64	26.92	22.00
% of stock to total stock		100	73.78	7.51	10.30	8.41

Table No.5A**Working Circlewise Volume in cum. per ha**

Sr. No.	Name of Working Circle	Total	General utility species	Special utility species	Minor forest produce species	Other species
1	2	3	4	5	6	7
1	AWC	11.74	7.24	0.19	0	4.31
	% of stock to total stock	100	61.68	1.63	0	36.69
2	CAT W.C.	43.15	29.75	6.23	5.07	2.10
	% of stock to total stock	100	68.96	14.44	11.74	4.86
3	SCI W.C.	69.41	48.89	9.84	7.07	3.61
	% of stock to total stock	100	70.44	14.18	10.18	5.20
4	FIWC	8.55	0.86	6.79	0.90	0
	% of stock to total stock	100	10.03	79.38	10.59	0
5	SCI/MISC W.C.	63.88	49.87	7.30	6.71	0
	% of stock to total stock	100	78.06	11.43	10.51	0
6	SCI/CAT W.C.	48.45	38.99	4.31	3.09	2.06
	% of stock to total stock	100	80.49	8.89	6.38	4.24
7	CAT/MISC	66.47	49.54	8.89	1.83	6.21
	% of stock to total stock	100	74.53	13.38	2.75	9.34
8	SCI/FIWC	84.37	31.09	46.17	0.70	6.41
	% of stock to total stock	100	36.85	54.72	0.83	7.60
9	SCI/AWC	5.83	4.02	0	1.81	0
	% of stock to total stock	100	69.02	0	90.98	0
10	Misc. W.C	0	0	0	0	0
	% of stock to total stock	0	0	0	0	0
Total weighted average		50.65	35.51	7.08	4.87	3.19
% of stock to total stock		100	70.12	13.97	9.62	6.29

Highlights from the results of tree enumeration as given in table No.5, are summarised below:

C:\Users\apio\Desktop\email copies Yawal. Gadchiroli, Pusad W. Nashik\Pusad Note.doc

1) Afforestation Working Circle:-

Catagorywise percentage of Species to total growing stock in this working circle is as given below

Sr. No.	Category of Species	Name of Species	% to total growing stock
1	A:-Species of General Utility	Ain, Lendia, Sajad, Teak.	53.73
2	B:-Species of Special Utility	Hiwar, Salai	2.31
3	C:-Species of Minor Forest Produce	No species reported in this group	0
4	D:-Other Species	Aal, Bhera	43.96

2) Catchment Area Treatment Working Circle:-

Catagorywise percentage of Species to total growing stock in this working circle is as given below

Sr. No.	Category of Species	Name of Species	% to total growing stock
1	A:- Species of General Utility	Lendia, Sajad, Teak	63.03
2	B:-Species of Special Utility	Bherra, Dhawada, Hiwar, Moin, Salai	9.28
3	C:-Species of Minor Forest Produce.	Bel, Moha,Neem, Palas, Tendu.	18.69
4	D:-Other Species	Aal, Amaltas, Anjan, Bhokar, Dudhi, Fasi, Lokhandi, Pangra	9.01

3) Selection Cum Improvement Working Circle:-

Catagorywise percentage of Species to total growing stock in this working circle is as given below

Sr. No	Category of Species	Name of Species	% to total growing stock
1	A:-Species of General Utility	Ain, Lendia, Sajad, Teak.	78.00
2	B:-Species of Special Utility	Arjun, Bherra, Dhawada, Hiwar, Kalamb, Moin, Salai.	7.55
3	C:-Species of Minor Forest Produce	Behada, Bel, Biba, Bor, Char, Moha, Neem, Palas, Tendu.	8.64
4	D:-Other Species	Aal, Amaltas, Anjan, Bartondi, Bharati, Dhoban, Dudhi, Fasi, Khir, Kusum, Lokhandi, Mowai, Medsing, Papada, Rohan, Satpuda Others	5.82

4) Fodder Improvement Working Circle:-

Catagorywise percentage of Species to total growing stock in this working circle is as given below

Sr. No.	Category of Species	Name of Species	% to total growing stock
1	A:- Species of General Utility	Teak	25.00
2	B:-Species of Special Utility	Bherra, Salai	31.25
3	C:-Species of Minor Forest Produce	Palas, Tendu	43.75
4	D:-Other Species	No species reported in this group	0

5) SCI/Misc. Working Circle:-

Catagorywise percentage of Species to total growing stock in this working circle is as given below

Sr. No.	Category of Species	Name of Species	% to total growing stock
1	A:-Species of General Utility	Ain, Lendia, Sajad, Teak	71.05
2	B:-Species of Special Utility	Dhawada, Moin, Salai.	6.14
3	C:-Species of Minor Forest Produce	Palas, Tendu.	22.81
4	D:-Other Species	No species reported in this group	0

6) SCI/CAT Working Circle

Catagorywise percentage of Species to total growing stock in this working circle is as given below

Sr. No.	Category of Species	Name of Species	% to total growing stock
1	A:-Species of General Utility	Ain, Lendia, Sajad, Teak.	78.87
2	B:-Species of Special Utility	Bhera, Dhawada,Hiwar, Moin, Salai.	6.19
3	C:-Species of Minor Forest Produce	Bel, Char, Neem, Palas, Tendu.	7.22
4	D:-Other Species	Amaltas, Babul, Bahawa, Dudhi, Karu.	7.72

7) CAT/Misc. Working Circle

Catagorywise percentage of Species to total growing stock in this working circle is as given below

Sr. No	Category of Species	Name of Species	% to total growing stock
1	A:-Species of General Utility	Ain, Lendia, Sajad, Teak.	77.70
2	B:-Species of Special Utility	Bhera, Dhawada, Moin, Salai.	6.12
3	C:-Species of Minor Forest Produce	Char, Palas, Tendu.	3.96
4	D:-Other Species	Amaltas, Bahawa,Dudhi, Kusum, Lokhandi, Padri, Satpuda.	12.22

8) SCI/FIWC

Catagorywise percentage of Species to total growing stock in this working circle is as given below

Sr. No	Category of Species	Name of Species	% to total growing stock
1	A:-Species of General Utility	Ain, Teak.	53.34
2	B:-Species of Special Utility	Dhawada, Kalamb.	20.00
3	C:-Species of Minor Forest Produce	Palas.	13.33
4	D:-Other Species	Anjan, Medsing.	13.33

9) SCI/AWC

Catagorywise percentage of Species to total growing stock in this working circle is as given below

Sr. No	Category of Species	Name of Species	% to total growing stock
1	A:-Species of General Utility	Teak.	50.00
2	B:-Species of Special Utility	No species reported in this group	0
3	C:-Species of Minor Forest Produce	Palas	50.00
4	D:-Other Species	No species reported in this group	0

10) MISC Working Circle :- No Species reported by Dy. CF WP Yavatmal

Table No.6

Availability of Teak in Previous (Oct-2003 to March-2004) Enumeration in (No. of sound trees per ha.)

Sr. No	Name Working Circle	Total growing Stock	Teak/Ha	% of stock of trees to the total stock
1	2	3	4	5
1	Afforestation Working Circle	167	77	46.11
2	Catchment Areat Treatment Working Circle	198	108	54.55
3	Selection Cum Improvement Working Circle	298	179	60.07
4	Overlapping Working Circle	407	238	58.48
5	Sequence of felling and planting in Fodder Reserve W.C.	245	105	42.98
	Weighted Average	266.32	152.03	57.09

Table No.6 (A)

Availability of Teak in Current (Sept-2015 to Feb-2016) enumeration. (No. of sound trees per ha.)

Sr. No	Name Working Circle	Total growing Stock	Teak/Ha	% of stock of Teak trees to the total stock
1	2	3	4	5
1	Afforestation Working Circle	82.76	42.34	51.16
2	Catchment Treatment W.C	234.45	144.92	61.82
3	Selection Cum Improvement Working Circle	355.24	262.50	73.89
4	Fodder Development Working Circle	40.00	10.00	25.00
5	SCI/Misc. W.C	285.00	172.50	60.53
6	SCI/CAT W.C.	215.55	161.11	74.74
7	CAT/Misc.W.C.	308.89	232.22	75.18
8	SCI/FIWC	150.00	70.00	46.67
9	SCI/AWC	64.00	32.00	50.00
10	Misc. W.C.	0	0	0
	Total (Weighted Average)	261.44	183.39	70.14

Statistical Analysis: -

The Statistical personnel of the office of the Chief Forest Statistician, Maharashtra State, Nagpur has carried out the statistical analysis of the data. The percentage standard error is calculated for each Working Circle is given in the following table No. 7

Table No.7
Working circlewise standard error

Sr. No.	Name of working circle	Population area in ha	Sample area in ha	Intensity of sampling %	% Standard Error
1	Afforestation W.C.	11292.75	4.70	0.04	16.49
2	Catchment Treatment W.C	12979.72	6.3	0.05	10.07
3	Selection Cum Improvement W.C.	35049.74	11.6	0.03	6.07
4	Fodder Improvement W. C.	1024.38	0.40	0.04	61.22
5	SCI/Misc. W.C	1564.28	0.40	0.03	22.4
6	SCI/CAT W.C.	2521.86	0.90	0.04	22.04
7	CAT/Misc.W.C.	1820.85	0.90	0.05	15.37
8	SCI/FIWC	381.63	0.10	0.03	--
9	SCI/AWC	1121.97	0.50	0.04	10.6
10	Misc. W.C.	1667.79	0	0	--
	Total	69424.97	28.5	--	--

**Chief Forest Statistician,
Maharashtra State, Nagpur.**

